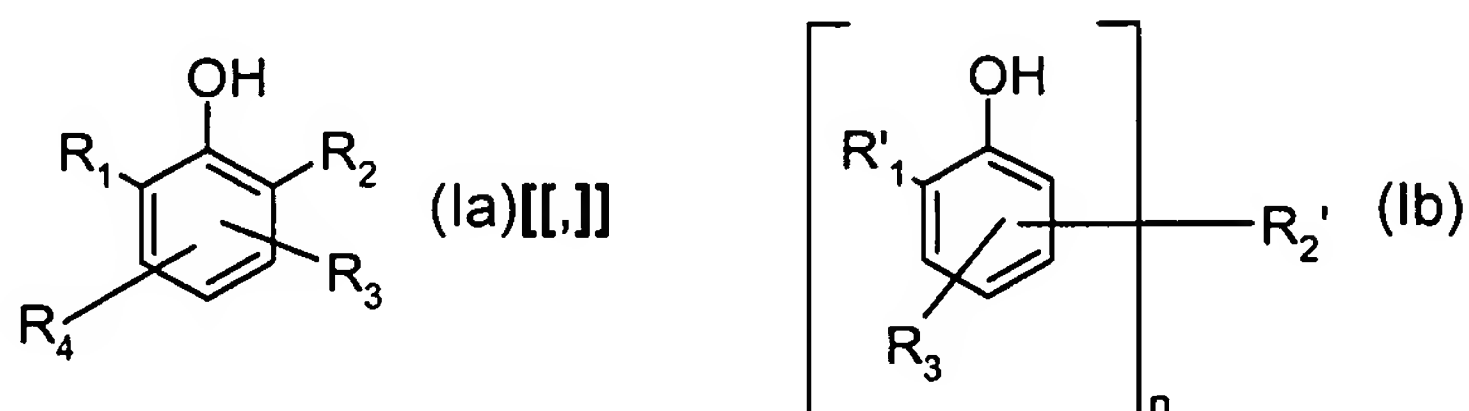


Claims

1. (currently amended) A composition comprising

a) a halogen containing polymer or copolymer in the form of an aqueous suspension or emulsion;

b) a sterically hindered phenolic antioxidant with a melting point of more than 20° C containing a compound of formula (Ia) or (Ib)



wherein

n is 2 or 3

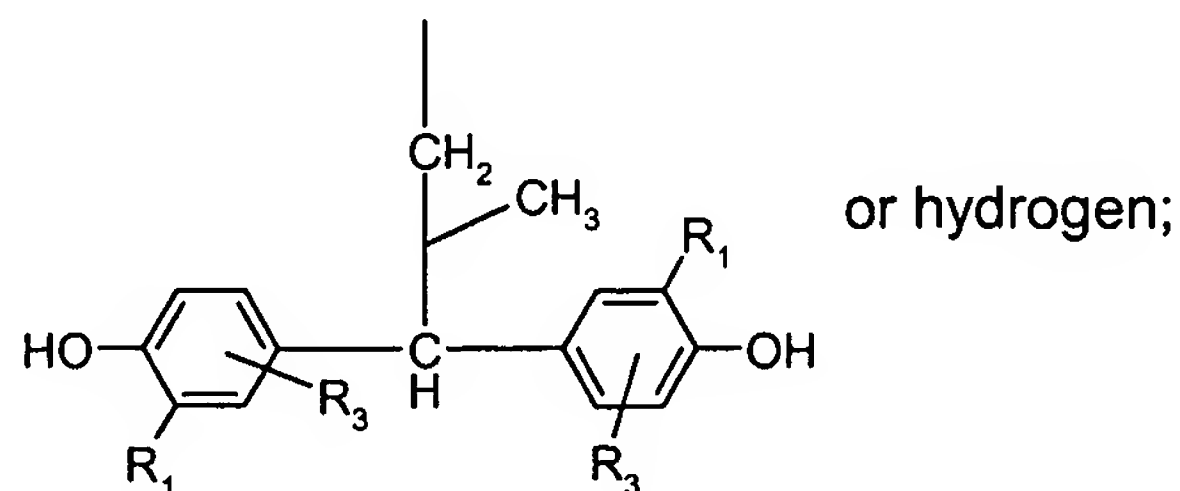
R₁ is tert-butyl, secondary bound C₃-C₁₈alkyl or C₅-C₆cycloalkyl;

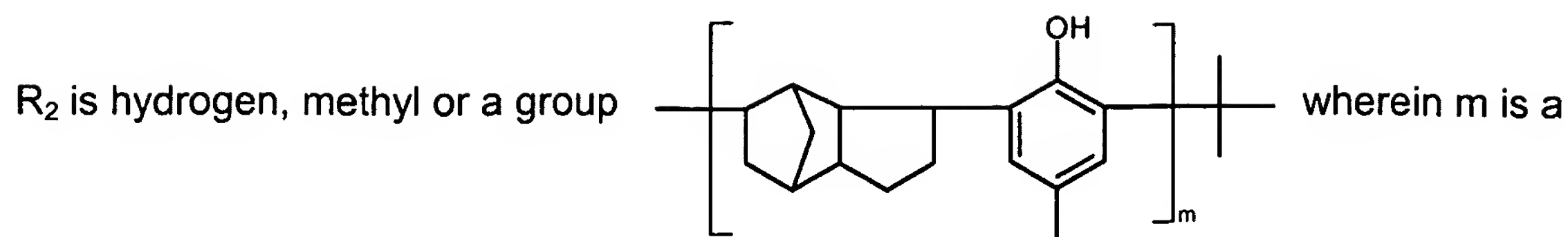
R'₁ is tert-butyl, primary or secondary bound C₁-C₁₈alkyl, phenyl, C₇-C₉phenylalkyl or C₅-C₆cycloalkyl;

R₃ is C₁-C₁₈ alkyl, C₁-C₁₈alkoxy, C₅-C₆cycloalkyl or -CH₂-CH₂-CO-O-(C₁-C₁₈)alkyl;

R'₂ is a divalent or trivalent bridging group;

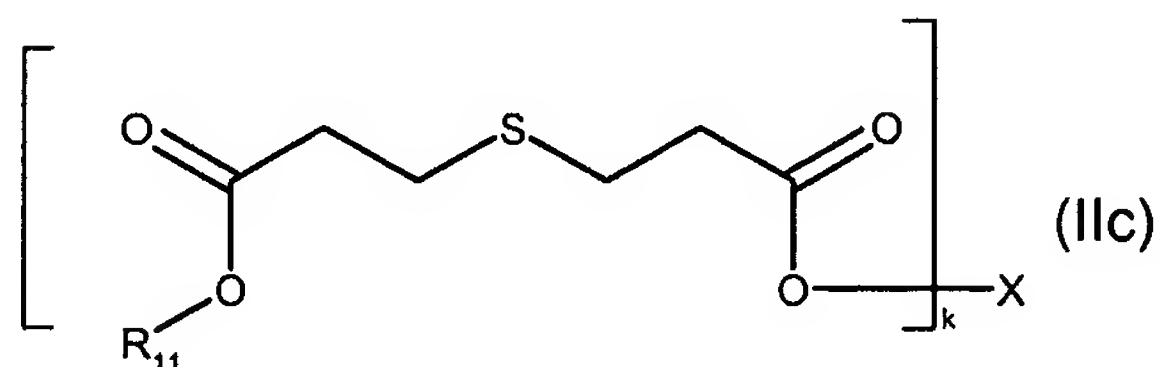
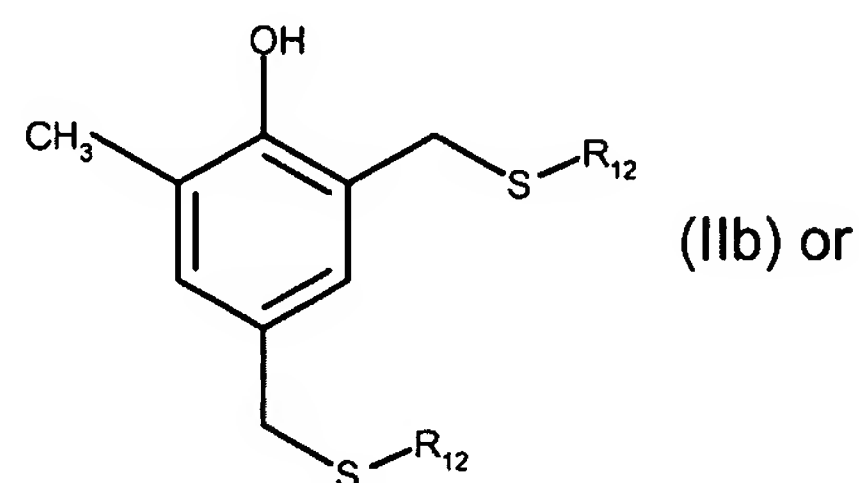
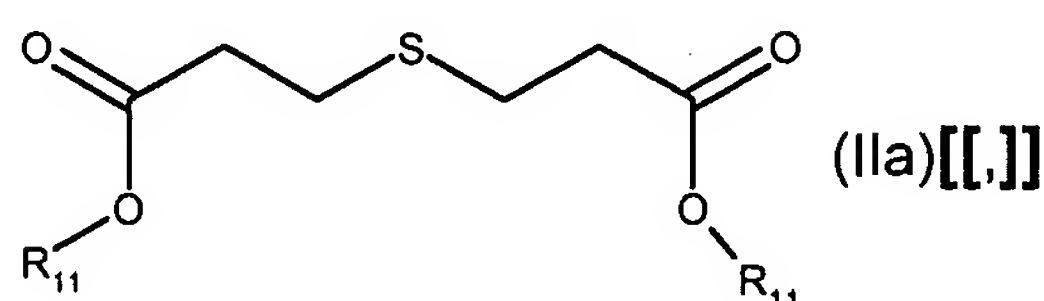
R₄ is a group





number from 1 to 10; and

c) a thioether or thioether-ester with a melting point of more than 20° C of formula (IIa), (IIb) or (IIc)



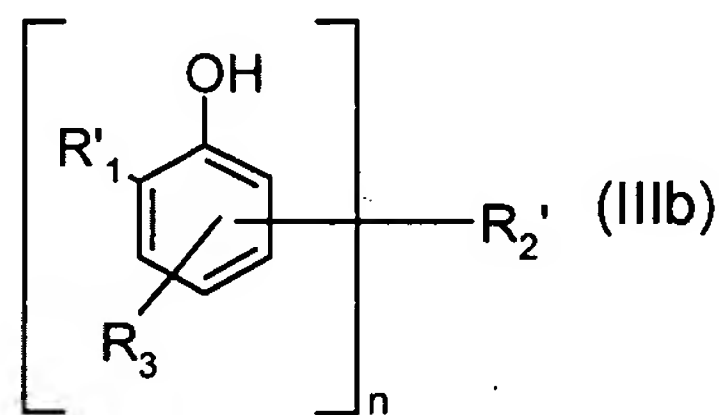
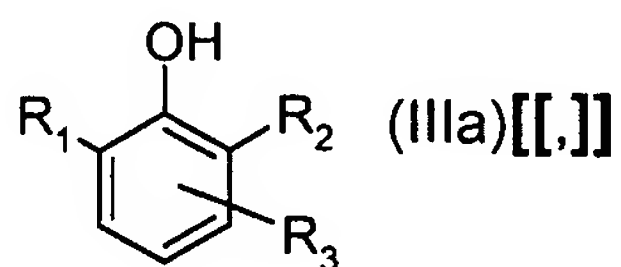
wherein

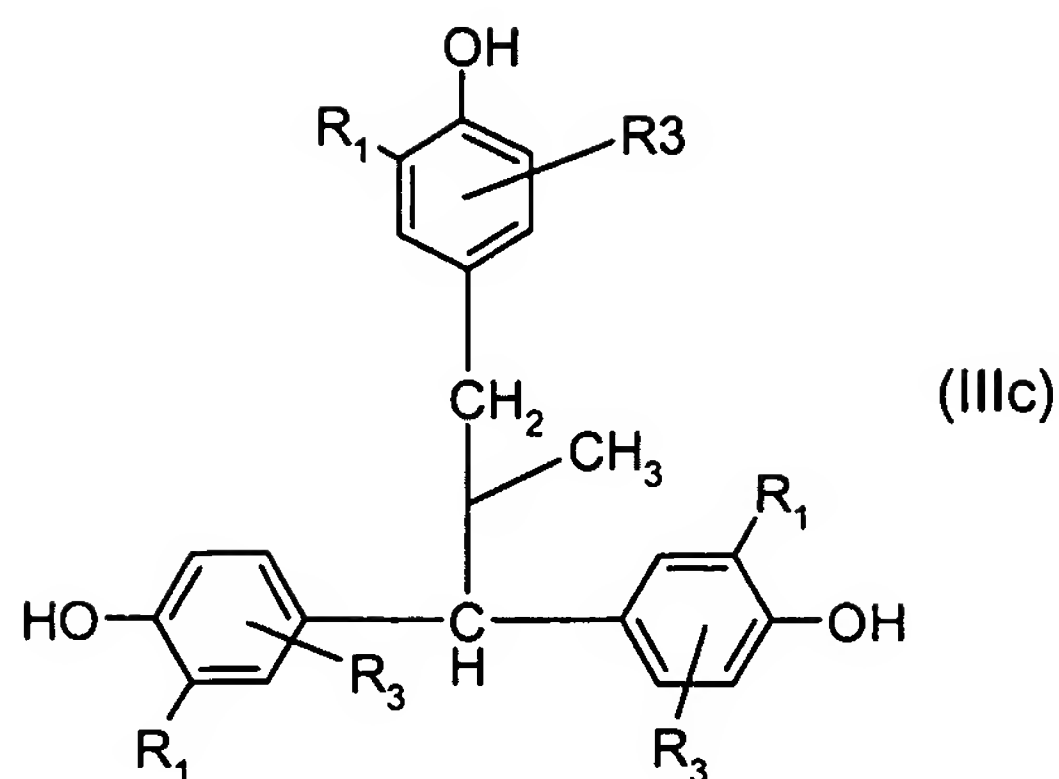
R_{11} and R_{12} are independently C_1 - C_{18} alkyl

k is 2-4; and

X is 2-methyl-1,2,3-propane-triyl- or 1,2,3,4-methane-tetryl-.

2. (currently amended) A composition according to claim 1 wherein the sterically hindered phenolic antioxidant containing a structural element of formula (Ia) or (Ib) is of formulae (IIIa), (IIIb) or (IIIc)





wherein

n is 2 or 3

R₁ is tert-butyl, secondary bound C₃-C₁₈alkyl or C₅-C₆cycloalkyl;

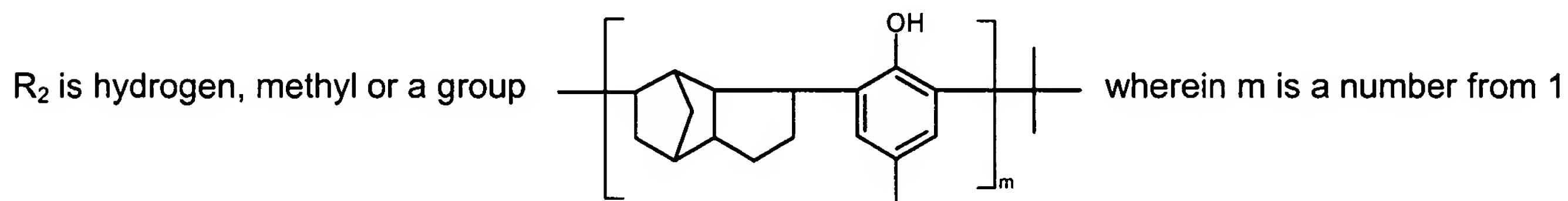
R'₁ is tert-butyl, primary or secondary bound C₁-C₁₈alkyl, phenyl, C₇-C₉phenylalkyl or C₅-C₆cycloalkyl;

R₃ is C₁-C₁₈ alkyl, C₁-C₁₈alkoxy, C₅-C₆cycloalkyl or a group

-CH₂-CH₂-CO-O-(C₁-C₁₈)alkyl;

R'₂ is C₁-C₁₂alkylene, -S-, trimethylene-isocyanurate, or a group

-CH₂-CH₂-CO-(OCH₂CH₂)_p-O-CO-CH₂CH₂- wherein p is a number from 1 to 3;



to 10.

3. (original) A composition according to claim 1 wherein the halogen containing polymer is PVC.

4. (original) A composition according to claim 1 wherein in component c) both R₁₁ are C₁₂alkyl or C₁₈alkyl and the R₁₂ are C₁₂alkyl.

5. (currently amended) A composition according to claim 1 wherein in component b) the sterically hindered phenolic antioxidant is

2-tert-butyl-4,6-dimethylphenol;

2,4-dimethyl-6-(1'-methylundec-1'-yl)phenol, 2,4-dimethyl-6-(1'-methylheptadec-1'-yl)phenol,

2,4-dimethyl-6-(1'-methyltridec-1'-yl)phenol, 2,4-dimethyl-6-(1'-methyltetradec-1'-yl)phenol or and mixtures thereof;

2,2'-methylenebis(6-tert-butyl-4-methylphenol), 2,2'-methylenebis(6-tert-butyl-4-ethylphenol),

2,2'-methylenebis(4,6-di-tert-butylphenol), 2,2'-ethylidenebis(4,6-di-tert-butylphenol),

2,2'-ethylidenebis(6-tert-butyl-4-isobutylphenol)

or

(ethylenebis(oxyethylene)bis[3-(5-tert-butyl-4-hydroxy-m-tolyl)propionate].

6. (currently amended) A composition according to claim 1 wherein in component b) the sterically hindered phenolic antioxidant is

2-tert-butyl-4,6-dimethylphenol[[,]] or 2,4-dimethyl-6-(1'-methyltetradec-1'-yl)phenol or a mixture thereof

and component c) is

di-lauryl-thio-di-propionate[[,]] or di-stearyl-thio-di-propionate or a mixture thereof.

7. (original) A composition according to claim 1 wherein in component b) the sterically hindered phenolic antioxidant is

2,4-dimethyl-6-(1'-methyltetradec-1'-yl)phenol

and component c) is

di-lauryl-thio-di-propionate.

8. (original) A composition according to claim 1 wherein the sterically hindered phenolic antioxidant, component b) is present in an amount from 50 ppm to 2000 ppm based on the weight of the halogen containing monomer.

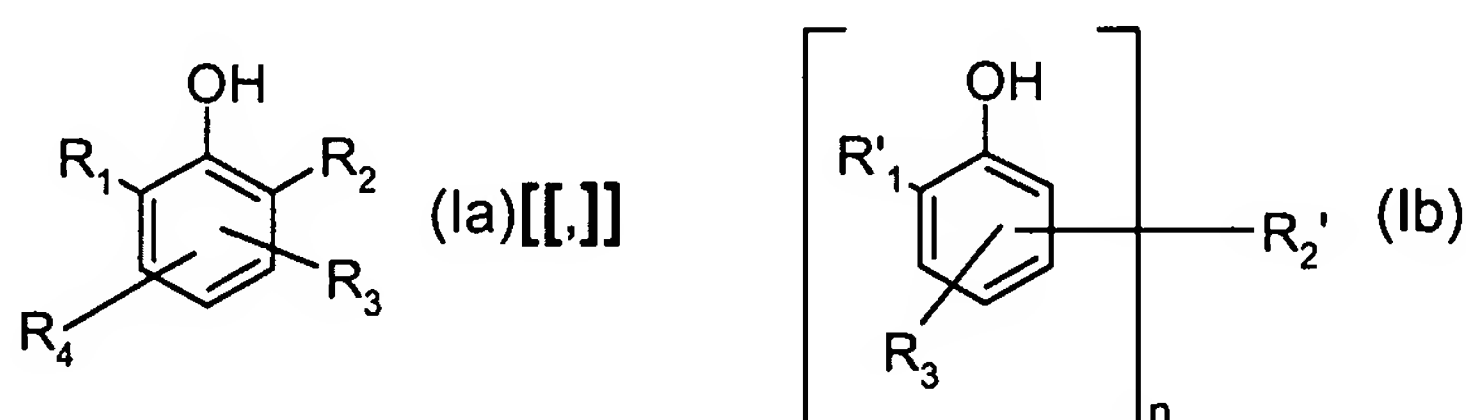
9. (original) A composition according to claim 1 wherein component c) is present in an amount from 50 ppm to 2000 ppm based on the weight of the halogen containing monomer.

10. (original) A composition according to claim 1 wherein the ratio of component b) to component c) is from 1:10 to 10:1.

11. (original) A composition according to claim 1, which additionally contains a sterically hindered phenolic antioxidant different from that of component b), a phosphorous containing stabilizer, a 2-benzofuranone stabilizer, a sterically hindered amine light stabilizer or a UV-absorber.

12. (currently amended) A process for the stabilization of halogen containing polymers against thermal degradation, which process comprises adding to the halogen containing polymer, which is in an aqueous suspension or emulsion during or after the polymerization process

b) a sterically hindered phenolic antioxidant with a melting point of more than 20° C containing a compound of formula (Ia) or (Ib)



wherein

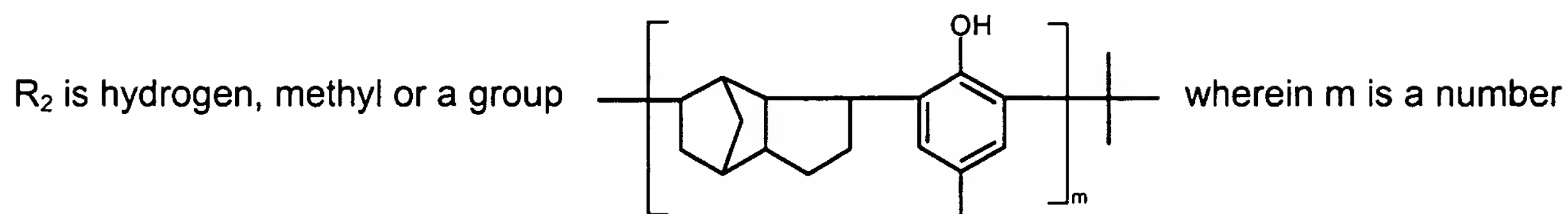
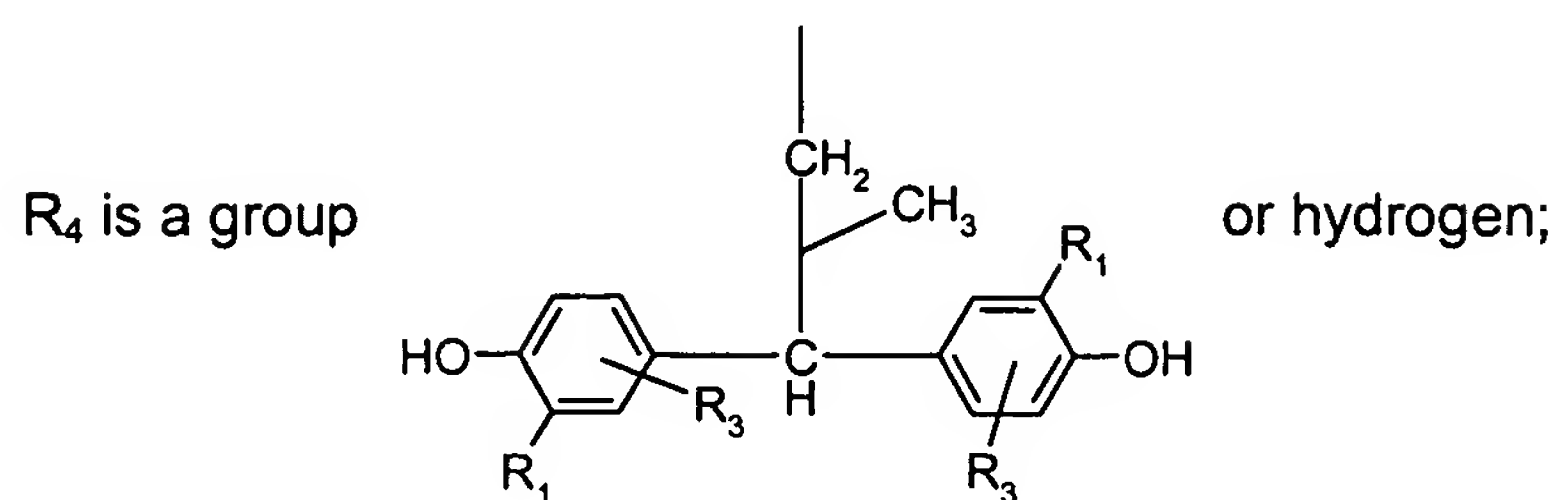
n is 2 or 3

R_1 is tert-butyl, secondary bound C_3 - C_{18} alkyl or C_5 - C_6 cycloalkyl;

R_1' is tert-butyl, primary or secondary bound C_1 - C_{18} alkyl, phenyl, C_7 - C_9 phenylalkyl or C_5 - C_6 cycloalkyl;

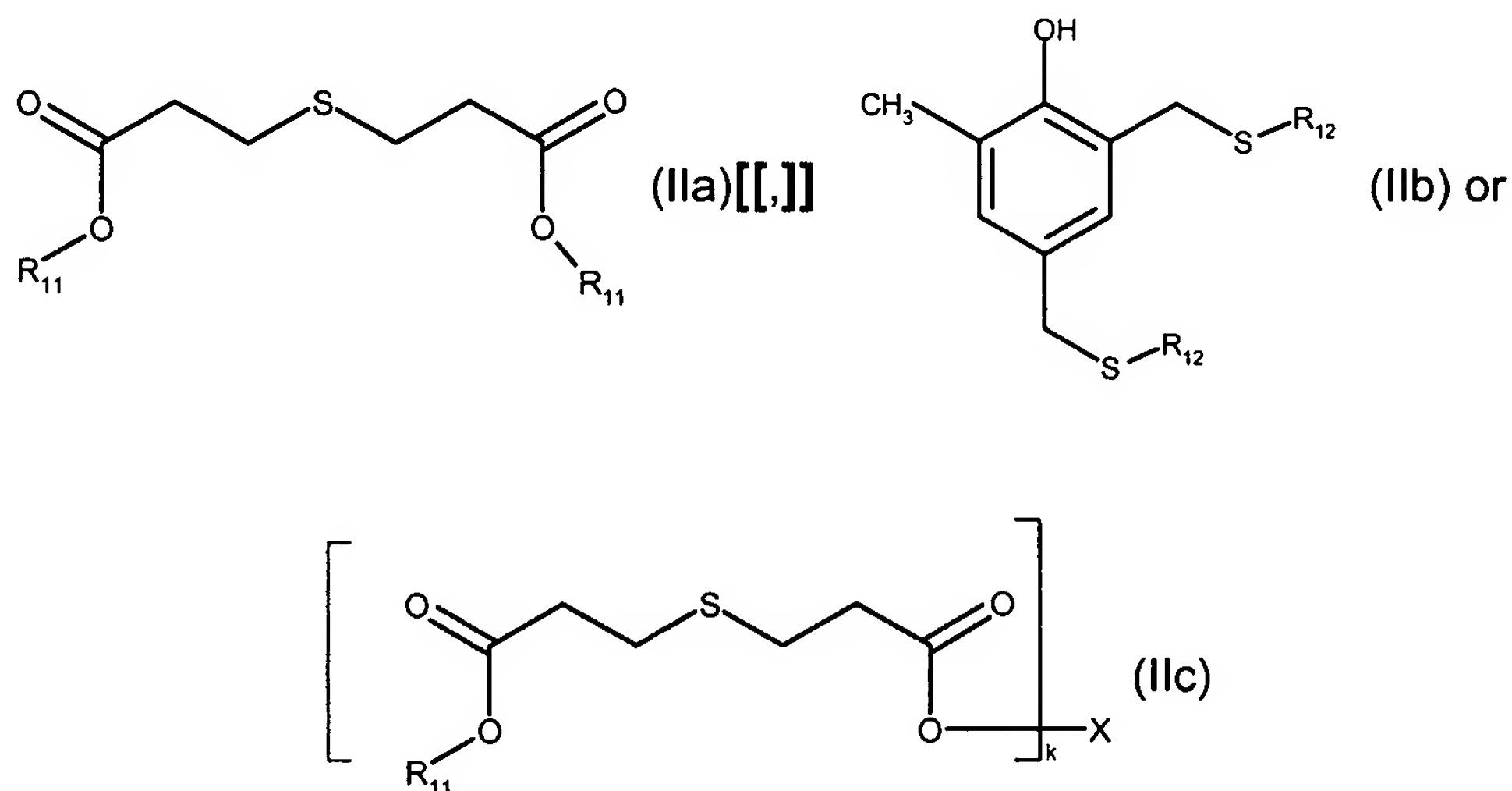
R_3 is C_1 - C_{18} alkyl, C_1 - C_{18} alkoxy, C_5 - C_6 cycloalkyl or $-\text{CH}_2-\text{CH}_2-\text{CO}-\text{O}-(\text{C}_1-\text{C}_{18})\text{alkyl}$;

R'_2 is a divalent or trivalent bridging group;



from 1 to 10; and

c) a thioether or thioether-ester with a melting point of more than 20° C of formula (IIa), (IIb) or (IIc)



wherein

R_{11} and R_{12} are independently C_1 - C_{18} alkyl

k is 2-4; and

X is 2-methyl-1,2,3-propane-triyl- or 1,2,3,4-methane-tetryl-.

13. (original) A process according to claim 12 wherein the components b) and c) are added towards the end of the polymerization reaction.

14. (currently amended) A process according to claim 12 wherein the polymerization is a suspension polymerization and the components ~~a) and b)~~ and c) are added as an emulsion to the slurry towards the end of the polymerization reaction.

15. (canceled)